MSU INVESTMENT PROPOSAL FOR INSTITUTIONAL PRIORITIES

PROPOSAL OVERVIEW

Title	Bioengineering Program	**Request Date**	January 3, 2012
Department	ChBE/College of Engineering	**Email**	rmarley@coe.montana.edu
Requestor	Robert Marley	**Phone**	Ext 2272

STRATEGIC ALIGNMENT

Core Themes and Objectives (check all that apply)

Educate Students

☒ Our graduates will have achieved mastery in their major disciplines

☒ Our graduates will become active citizens and leaders

☒ Our graduates will have a multicultural and global perspective

☒ Our graduates will understand the ways that knowledge & art are created and applied in a variety of disciplines

☒ Our graduates are prepared for careers in their field

☒ We will provide increased access to our educational programs

☒ Communities and external stake holders benefit from broadly defined education partnerships with MSU

Create Knowledge and Art

☐ Students, faculty, and staff will create knowledge and art that is communicated widely

Serve Communities

☒ We help meet a fundamental need of the citizens of Montana by providing degree programs for our students

☐ We help meet the educational needs of the citizens of Montana by providing a wide range of educational opportunities to a variety of students

☐ Our students, faculty, staff, and administrators reach out to engage and serve communities

☐ Our students, faculty, staff, and administrator reach in to build the university community

Integrate Learning, Discovery, and Engagement

☒ Each graduate will have had experiences that integrate learning, discovery and engagement

☐ Outreach activities will educate students and address the needs of the communities we serve

☐ Students, faculty, and staff will create knowledge and art that addresses societal needs

☐ MSU is a community that will be characterized by synergy within and across disciplines, roles and functions.

Stewardship

☒ The public trusts the institution to operate openly and use resources wisely

☒ The faculty and staff are well-qualified and supported

☐ MSU will support Native American students, programs, and communities

☒ MSU will be an inclusive community, supporting and encouraging diversity

☒ Our publicly provided resources are used efficiently and effectively

☐ Natural resources are used efficiently and sustainably

☐ MSU nurtures a culture of resource conservation and ecological literacy among students, faculty and staff

☐ Our physical infrastructure (e.g., building, equipment, open spaces) will be well-maintained and useful

INSITUTIONAL BENEFIT						
Campuses	☒ Bozeman ☐ Billings ☐ Havre ☐ Great Falls ☐ FSTS ☐ Extension ☐ MAES					
Cross Depts	Please List: ChBE, Chem-Biochem, Math-Stats, Univ-Seminar, Other COE					
TIMEFRAME						
Proposed Dates	Start: July 1, 2012		End: N/A (base adjustment)			
COST AND REQUIREMENTS						
Funding Type	One-Time ($)	Multi-Year ($)			Base ($)	FTE
		Year 1	Year 2	Year 3		
Personnel (*w/benefits*)					200,060.	4.5
Materials & Supplies						
Travel					3,000	
Contracted Services						
Capital						
Other Operations					40,000.	
TOTAL					243,060.	4.5

Please comment, if necessary, regarding cost and requirements.

Personnel:

1.	New Faculty (1.0 FTE) in Bioengineering	$108,000	(80,000 + 35% benefit)
2.	TAs (2x) to support new sections of BioE	$41,060	(stipend, tuition, benefits)
3.	Support staff (1.0FTE) for assisting Dept in total growth	$34,800	(24,000 + 45% benefit)
4.	Support staff (0.5FTE) for advising international students	$16,200	(12,000 + 35% benefit)
	Sub-Total	$200,060	

Operational Support for Additional Sections:

1.	Chemistry & Biochemistry Dept	$15,000
2.	Mathematics & Statistics Dept	$15,000
3.	Writing Center and University Seminar	$10,000
	Sub-Total	$40,000

Travel:

1.	Approx cost for one "maintenance visit" to Turkish partners	$3,000

Program TOTAL $243,060.

PROPOSAL SCOPE
Describe the Proposal

Summary

The College of Engineering has established as its highest priority the procurement of base funding to support a BS program in Bioengineering. This program was developed subsequent to a AAAS report outlining opportunities for the future of the MSU Chemical Engineering Department. The report emphasized the rapid growth in the demand of engineers trained in "bioprocesses" (defined broadly) and provided our faculty with recommendations concerning niche areas that MSU could develop. It was also noted that such a program would be quite unique in the Northern Rockies, Northern Plains and Northwestern U.S. regions.

Concurrently, an opportunity arose to partner with one or more international universities to offer a "dual-diploma program" (DDP) in the area of bioengineering. Specifically, the Chemical Engineering Faculty at Istanbul Technical University (ITU) was interested in partnering with MSU to accomplish the same goals—creating a new BS Program in Bioengineering. ITU is generally considered one of the oldest, largest and highest quality STEM focused universities in Europe. Initially, the two institutions collaboratively could offer a world-class degree program by exploiting the excellence at both campuses with little or no "start-up" expenses (though long-term sustainability must be addressed). Thus, MSU and ITU entered into an agreement in 2005 for a DDP in Bioengineering. A DDP is essentially a well-articulated transfer agreement wherein the student from ITU would complete two years at their home institution and two years at MSU, then receive a BS degree from both institutions. The Turkish government promotes DDP relations for its state universities in order to help educate a larger percent of the very rapidly growing, college-bound population.

In addition to providing a basis for the MSU College of Engineering with a virtually instant jump-start in providing students with international experience and integration, the ITU-DDP was a mechanism by which the needed resources for a high-quality program in Bioengineering could be brought to MSU. In short, the DDP was an entrepreneurial, win-win approach to generate new resources for the University in order to fund a new program. To date, several million dollars in non-resident tuition has been paid by Turkish students to MSU as part of the Bioengineering DDP.

Furthermore, the Bioengineering program has now become one of the most rapidly growing programs ever at MSU, going from zero to 122 majors in a span of six years. These students represent a strong mix of resident and non-resident students and few have transferred from other degree programs at MSU. Most importantly, the non-resident students from ITU are representative of students and their tuition that would most certainly NOT be attending MSU if it were not for the Bioengineering DDP. Thus, with currently 58 students enrolled at MSU, the DDP in Bioengineering with Istanbul Technical University has been wildly successful, complementing the growth from other traditional sources.

However, base funding has never been provided to support the Bioengineering program for the long-term. The Provost has provided a series of one-time-only sums desperately needed to keep the program afloat given the rapid growth (designated as "bridge funds"). But these commitments ended in AY2010-11 and base funding is now sought to "permanently" support the Bioengineering program. It is stipulated that with the revenues generated by non-resident tuition of the Turkish students alone (many other non-resident BioE students not considered), the amount requested in this proposal represents a fraction of the overall new revenue to MSU, $243,060 versus $990,300 (estimated in AY2012-13). *Again, this represents only tuition from the DDP students—the actual return on investment is even higher.*

As can be seen from the description above, this proposal is modest and also seeks to appropriately fund other academic departments that have seen meaningful increases in demand due to the growth in Bioengineering.

The method by which the Bioengineering program has been developed was indeed unique and may be difficult to duplicate in other disciplines. Nevertheless, the ChBE faculty are to be commended for taking the risk to develop such a program that both meets future demand of engineers nationally and internationally, but to do so in a way that can provide meaningful financial support to the entire campus. Thus, your recommendation for base funding to continue the Program is sincerely requested.

The success of the Bioengineering Program, both through the DDP as well as through other measures is significant and the positive impact at MSU is demonstrable.

Budget Narrative

Personnel costs are limited to a new faculty member in the bioengineering area (1.0 FTE) plus TA support (2 students) for the courses that have grown substantially in enrollment (or are new) as a result of the BioE Program. "Support Staff" are also requested in order to help off-set the relatively large and disproportionate advising load that the Turkish students present.

This includes a relatively regular examination of course and degree requirements at two institutions. This has often been referred to internally as "maintenance costs" for the DDP. The factor of distance from Istanbul is one minor complication, but working with demanding students and evolving curricula at two top institutions represents a realistic work load. Fortunately, a staff "super-advisor" can assist the faculty greatly for a relatively modest investment. This advising function can assist with other international students in engineering as well. In addition, the ChBE Department is very thin in terms of administrative support. Therefore, the current proposal contains at best estimate of 1.5 FTE staff for both advising and administrative assistance.

Operational support for non-engineering departments for additional sections were based upon previous estimates provided for additional loads due the BioE students.

Lastly, periodic (annual) travel to meet with the educational partners at ITU is required for both Program continuity ("maintenance") as well as accreditation purposes. Faculty and administrators are routinely in communication via email, etc, but face-to-face meetings are essential for complete communications about all aspects of the Program.

PROPOSAL SCOPE

Describe the broader impacts and benefits of this proposal

The broader impact and benefit of this proposal is three-fold. First, it allows the ChBE faculty to continue to offer a program that has become rapidly successful in terms of enrollment and degree productivity. The BioE program has rapidly become one of the most successful programs of its kind in the U.S. and will help meet a critical demand for these engineers nationally and internationally.

Secondly, the nature of the Dual Degree Program with Istanbul Technical University has served as a model for collaboration with other international partners. It has stimulated interest by MSU students in pursuing learning experiences in Turkey in addition to enhancing faculty collaboration. Clearly the increase of a cohort of international students has helped diversify the student population, including gender diversity. Both are vital to the College of Engineering's strategic plans in regards to internationalization of its curriculum and experiences for students.

Third, the DDP has also served as a model for entrepreneurship in higher education. The financial model created is a win-win-win for all involved. The international student is provided an incentive to attend and graduate with a degree from a top-tier US institution; the faculty can be rewarded in a relatively timely fashion with needed resources for programmatic growth; and the institution can make significant marginal gains in discretionary revenue through non-resident tuition. In addition, it provides vital support to other MSU departments and programs offering core instruction for Bioengineering students.

ADDITIONAL INFORMATION

Implementation Plan *(Please describe with timelines)*

The Bioengineering program was developed and implemented beginning in AY2005 with the understanding that growth of new students to MSU, revenues from these new students would be made available to the (then renamed) Chemical & Biological Engineering Department. See attached MOU signed by all relevant MSU officials, but never executed.

Initial costs for startup, including course development, instruction, and travel for DDP construction, were borne by the ChBE Department and College of Engineering. When the first cohort of DDP student arrived from Turkey, the Provost stepped up to help cover some of the cost of instruction with OTO monies which have been renewed each year. But this support has ended.

Assessment Plan *(Please describe with indicators)*

Enrolment and Graduation Information

The Bioengineering Program was formally initiated in 2006 with first graduates in 2010. As a newly authorized Program, Bioengineering started with an enrollment of zero and has grown to 122 (Fall, 2011). Likewise, the first cohort of graduates was in Spring, 2010, with two graduates. Last Spring (May, 2011), saw 9 graduates and approximately 25 are anticipated to graduate in during AY2012.

Financial Calculations for Turkish DDP students

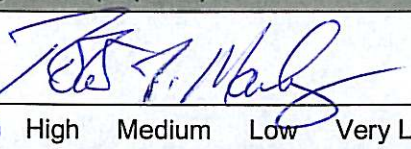
Estimated tuition and fees paid by Turkish DDP students = **$990,300.** Figure based upon estimated 60 students in Fall, 2012 (58 currently enrolled), each paying $16,505 (estimated Fall, 2012, rate of $20,005 for non-resident, less $3,500 tuition discount negotiated for ITU students). Current request represents less than 25% of revenue generated by DDP students alone (other non-resident, US national students, have not been included in this calculation).

If assessed objectives are not met in the timeframe outlined, what is the plan to sunset this proposal?

The goals of the Bioengineering Program have been met. Students from Montana, regionally, and internationally have been attracted to join the Program at MSU. It is critical that the financial needs of the Department and Program be met in order for the Program to continue.

If financial needs are unmet, Departmental and College leadership may be forced to prioritize amongst other growing programs in engineering and computer science. This would no-doubt lead to a reduction in our ability to meet the educational needs of Montana.

Moreover, if unfunded, this will also result in a serious morale issue, not only amongst COE faculty, but faculty throughout MSU who have witnessed the Bioengineering program grow rapidly with the promise of new revenues to be shared and cover the costs of this successful growth.

SIGNATURES		
Department Head *(please print)*	**Signature** *(required)*	**Date**
Brent Peyton		1/3/12
Dept Head Priority *(please circle one):*	Very High High Medium Low Very Low	
Dean/Director *(please print)*	**Signature** *(required)*	**Date**
Robert Marley		1/3/12
Dean/Director Priority *(please circle one):*	Very High High Medium Low Very Low	
Executive/VP *(please print)*	**Signatures** *(required)*	**Date**
Executive/VP Priority *(please circle one):*	Very High High Medium Low Very Low	

Memorandum of Agreement

Revenue Sharing Plan for International Undergraduate Students in the College of Engineering

Scehduled Effective Date of Plan = Fall 06 (FY 07)
Applies only to Undergraduate Students and not to Graduate Students
Only Fall and Spring semester will be used in this agreement

Amounts and Figures Subject to Change:
1. **Tuition amount (not counting fees) will change each Fall**
2. **Cost of Education amount could change each Fall**
3. **The % for the split for funds going to Academic Affairs versus Other Areas will change each Fall.**

The goal of this program is to increase the enrollment of international undergraduate students in the College of Engineering. The program is designed to provide an incentive for international recruiting and the financial means to do the recruiting.

Baseline: (numbers over baseline to be supplied B. Sharpe & net revenue by Nancy Powell)
The proposal is to use a two-year annual average of international students based upon FY 05 (27.5) and FY 06 (22.5) equaling 25.0.

Distribution of funds will be made shortly after the 15th class day of spring semester

Per student example of funding split - Undergradutes
This is the proposed revenue split for tuition paid by international students in Engineering over and above the baseline enrollment. In 06-07, each international student pays $14,322 in tutiton (not counting fees). This and the following figures are based on a student who pays the full rate. Any discounting would reduce the average student revenue in this calculation.

The 06-07 cost of education is $10,972 (supplied by Kathy Attebury). This is $3,350 under the tuition collected.

Of the $ 10,972
The split of the Cost of Education is 49.57% of Academic Affairs & 50.43% to other areas.
(This is the 7/1/05 Academic Affairs Base/Total 7/1/05 University Base)

0.4957	% of	$ 10,972	is	$	5,439
0.5043	% of	$ 10,972	is	$	5,533

Allocate $ 5,439 to Academic Affairs & $ 5,533 to the rest of the University.

Of the	$	5,439	allocated to Academic Affairs:		
Allocate		0.80	%	$ 4,351	to the College of Engineering
Allocate		0.20	%	$ 1,088	to the Provost for extra section funding.

Of the	$	5,533	allocated to A&F & Student Affairs:		
Allocate		0.78	%	4,316	to A&F
Allocate		0.22	%	1,217	to Student Affairs

Of the	$	3,350	(tuition less cost of education):		
Allocate		0.70	%	$ 2,345	to the College of Engineering
Allocate		0.30	%	$ 1,005	to the Provost & OIP

Any tuition discounting or Agents' Fees that reduces the total revenue from the student

would be deducted from this $3,350 before the 70/30 split is taken.

Summary

For Undergraduates without any discounting:

The non-academic side of the institution get $ 5,533 which is 38.63% of the $14,322 to pay a share of the non-instructional costs.
The Provost gets $ 1,088 and $ 1,005 for a total of $ 2,093 to cover extra sections needed by the students and other costs.
The College of Engineering gets $ 4,351 and $ 2,345 for a total of $ 6,696 to cover costs and invest in growth in the student's department and in the Dean's Office.

5-24-06
Robert Marley, Dean of Engineering Date

Kathy Attebury 5/30/06
Kathy Attebury, Budget Director Date

James B Rimpau 5-30-06
James Rimpau, Executive Director of Planning & Analysis & Chief Information Officer Date

5.30.06
Craig Roloff, Vice President for Administration & Finance Date

David M Dooley 5.30.06
David M. Dooley, Provost & Vice President for Academic Affairs Date